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|-------------------------------|------------------------|---------------------|--|
| <b>Notice of Allowability</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                               | 10/624,406             | HANNAH ET AL.       |  |
|                               | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                               | VanThu Nguyen          | 2824                |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed on 12/20/2004.
2. ☒ The allowed claim(s) is/are 1-22.
3. ☒ The drawings filed on 07/21/2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).


\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</li> <li>2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</li> <li>3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br/>Paper No./Mail Date _____</li> <li>4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br/>of Biological Material</li> </ol> | <ol style="list-style-type: none"> <li>5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</li> <li>6. <input type="checkbox"/> Interview Summary (PTO-413),<br/>Paper No./Mail Date _____</li> <li>7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment</li> <li>8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance</li> <li>9. <input type="checkbox"/> Other _____</li> </ol> |
|--|---|

  
 VanThu Nguyen  
 Primary Examiner  
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**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's arguments, see Amendment filed December 20, 2004, with respect to Requirement for Restriction/Election filed on July 23, 2004, have been fully considered and are persuasive. Therefore, claims 1-22 are rejoined for examination.

***Examiner's Amendment***

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Replace the Title with --MAGNETIC SEMICONDUCTOR MEMORY AND THE READING METHOD USING SPIN-POLARIZED ELECTRONS BEAM--

Replace the Abstract with:

--A system for writing data to and reading data from a magnetic semiconductor memory utilizing a spin polarized electron beam. The magnetic semiconductor memory comprises a plurality of storage locations, each storage location includes a magnetic material and a layer of semiconductor material capable of emitting photons. The method of reading data from the magnetic semiconductor memory comprising steps of directing a spin-polarized electron beam at the magnetic semiconductor memory, and detecting the light emission state of the semiconductor layer from the magnetic semiconductor memory.--

***Allowable Subject Matter***

3. Claims 1-22 are allowed.

The following is a statement of reasons for the indication of allowance:

The prior art made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations. Masumoto et al., Komuro et al., and Hurt et al., taken individually or in combination, do not teach the claimed invention as claimed in claims 1, 10, and 16.

*Regarding claim 1:*

Komuro et al. and Masumoto et al. both disclose a system comprising a medium including a quantum well and a layer of semi-conductor material capable of emitting photons, but not a source of substantially spin-polarized electrons, and the quantum well is not spin-dependent.

Hurt et al. disclose a source of substantially spin-polarized electrons; a medium which interacts with the spin-polarized electrons, the medium including a spin-dependent quantum well, but not a layer of semi-conductor material capable of emitting photons.

*Regarding claim 10:*

Komuro et al. and Masumoto et al. both disclose a method comprising step of detecting the light emission state of a semi-conductor layer of a magnetic domain, but not step of directing at the magnetic domain a beam of electron substantially polarized in a particular spin state.

Hurt et al. disclose a method for reading the spin state of a magnetic domain comprising step of directing at the magnetic domain a beam of electrons substantially

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polarized in a particular spin state, but not step of detecting the light emission state of a semi-conductor layer of the magnetic domain.

*Regarding claim 16:*

Komuro et al. and Masumoto et al. both disclose a medium including magnetic material and a layer of semiconductor material capable of emitting photons, but the medium is not a storage medium.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

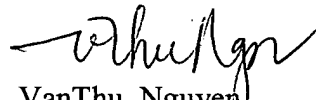
4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VanThu Nguyen whose telephone number is (571) 272-1881. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

February 4, 2005



VanThu Nguyen  
Primary Examiner  
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